

**Department of Water Resources  
Division of Flood Management  
Hydrology and Flood Operations Office  
Flood Maintenance Office**

**Flood Season Readiness Briefing  
Reclamation Board Meeting  
December 21, 2007**

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## **Hydrology, Rivers, Reservoirs, and Snow**

### **River Forecasting and Reservoir Coordination**

- Monitor shifts began Oct 15 providing twice daily forecasts of river conditions
- Oroville-New Bullard's Bar Coordinated reservoir operations for flood control begins this season
- Other standard operations include:
  - Forecast reservoir inflows
  - Process hydro-meteorologic data for public use
  - Forecast snowmelt runoff
  - Coordinate field data collection

### **Water Supply and Snow Surveys**

- The 1<sup>st</sup> Water Supply indices were issued Oct 5—monthly updates will continue through May
- Coordination of the Calif. Cooperative Snow Survey Program continues—2007 annual meeting Nov 7-9
- Issue Bulletin 120, Water Conditions in California Feb-May –1<sup>st</sup> snow survey of 2008 will be Jan 3<sup>rd</sup>.
- Ongoing activity:
  - Collect, assemble and manage precipitation and snow data
  - Maintain 119 snow sensors (we get to about 2/3 of them in any year) and over 200

### **Hydrology Update**

- Update central valley hydrology—Activity underway via contract with USACE
- Planned project: update Bulletin 1 : An Inventory of CA's Water Resources
- Planned project: Develop hydrology outside the central valley

### **System Re-Operation**

- Develop methodology to integrate flood control and water management
- Initiate reservoir operations with conjunctive use programs

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## Flood Response Emergency Preparedness

### Pre-Season Flood Coordination and Meetings

- October 11: Riverside County Local Flood Management and Emergency Response Agencies
- October 23: Sacramento Local Flood Management and Emergency Response Agencies
- October 24: Stockton Local Flood Management and Emergency Response Agencies
- October 25: Yuba City Local Flood Management and Emergency Response Agencies
- October 31: USACE/DWR Annual Flood Season Coordination
- November 6: SMUD Winter Preparedness and EOC Overview
- November 9: Sacramento Operational Area OES
- November 15: PAO Emergency Response Coordination
- November 19: Delta Reclamation District / Local Maintaining Agencies
- County OES Meetings
- Participated in OES Mutual Aid Regional Advisory Committees
- Eureka Flood Center Coordination

### Emergency Response and Security

- Southern California Fire Recovery Coordination (Zaca, October Fires)
  - Joint Field Office Coordination (FEMA/Cal OES)
  - Multi Agency Support Group
    - BAER Team Members
    - BAR Task Force Members
- Flood Operation Center Emergency Response Coordination
- Technical assistance provided to Santa Barbara County by Flood Fight Specialist
- FOC Emergency Response Team Coordination
  - Incident Command Teams
    - A recruiting notice has been sent to various DWR divisions to staff ICTs
    - A preseason meeting with Incident Commanders and FOC Management is scheduled for December 20th
    - Communication trailers & FOC Radios are ready to go
  - Standardized Emergency Management System/National Incident Management System Training
    - New staff being trained as of November 2, 2007

### Flood Fight Training Classes

DWR has been providing Flood Fighting Methods training for over 40 years. The Flood Fight Specialist and six Levee Inspectors provide training to State and Local Agencies. The training class consists of a half day of classroom instruction and a half day of 'hands-on' field participation.

- 07 – 08 Training Season (Sept. thru Jan.)
- We anticipate 700 - 800 people trained this season.
- 06 – 07 Training Season – 763 people trained.

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## **FOC Improvements**

### **FOCIS Portal Improvements**

- CDEC
  - Flood Fight Methods
  - Flood Fighting at home
  - Flood Preparedness Guide for Levees Maintaining Agencies
  - Guide for Living by a Levee
  - High Water in CA
- FOC IT readiness
- Web-cast to provide weather briefing to flood control agencies via internet
- Reminders: (800)952-5530 for recorded conditions and forecasts  
(916)574-2619 to call the Flood Center  
flood\_center@water.ca.gov to email the Flood Center
- Directory of Flood Officials and Emergency Telephone Cards distributed as of November 1st

## **Delta Emergency Response**

- DOE to pre-deployed rock materials to 3 strategic locations (Hood, Rio Vista, & Port of Stockton)
- Emergency Operations Plan development has begun—early outreach pending.
- Pre-event Early Implementation Plan
- Delta Flood Response Group

## **Enhanced Flood Response and Emergency Preparedness—Project planned to begin this fiscal year**

- Development of Local Emergency Plans
- Model Improvements – Forecasts and Assessments
- Training with external partner agencies
- Implement Enhancements to support internal and local response plans
- Develop Coordinated Reservoir Operations

## **Flood Control System Evaluations and Reporting**

- Completed San Joaquin River system erosion surveys and mapped sites
- Collection and evaluation of over 2,500 historic levee distress events
- Developed geo-referencing tool to locate distress events
- Spring 08 will begin evaluating levee system integrity and hydraulic carrying capacity of channels
- As evaluations progress, will develop and publish system channel hydraulics report, levee system assessment report, and annual status reports for individual Local Maintaining Agencies' (Dec 08)
- Developing a statewide flood control system documentation database and library

## **Flood Project Inspections**

- Completed Spring/Summer levee, channel, and structure inspections. Fall inspections underway.
- Developing and implementing a "short-term" levee vegetation management plan

## **Flood System Assessment and Reporting**

- Annual Review of System Status
- Technical Overview
- Overall System Assessment
- Responsibility / Accountability

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## Central Valley Flood Control System Inspections

DWR has aggressively increased its maintenance and inspection activities to bring the inspection program into closer compliance with expectations of the Corps' National Levee Safety Program. To date, DWR has completed the following inspections in 2007:

- Levees – Completed spring inspections of 1613 miles of levees. Fall inspections are underway.
- Channels – Completed inspections of 25 unleveed flood control project channels
- Structures – Completed inspections of 56 major flood control structures
- LMA Self-Inspections – 65% of LMAs participated in the summer 2007 self-inspection program

### Inspection Criteria

As long-term levee management strategies and policies are being discussed, DWR has established short-term vegetation criteria that will protect levee integrity and allow most trees to remain. DWR will continue to inspect the levees each spring and fall using the same criteria for non-vegetation maintenance items as we have for decades with the goal of improving overall system maintenance and performance. Implementing and meeting the newly established short-term vegetation criteria will result in major system-wide maintenance improvements while protecting habitat. These criteria will identify critical deficiencies, encourage better maintenance practices, and allow consistent evaluation and reporting throughout the system.

#### Inspection criteria to allow visibility and flood fight access:

- Trees and vegetation trimmed and thinned along entire **landside** levee slope and toe easement
- Trees and vegetation trimmed and thinned along the top 20 feet of slope length of the **waterside** levee slope
- Document the presence of encroachments that obstruct visibility and flood fight access and those posing a threat to levee integrity

A letter explaining the short-term levee inspection criteria was recently mailed out to all federal flood control maintaining agencies. The November 21, 2007 letter is attached.

### Fall 2007 Inspections Status

As of December 5, 2007 field inspections are 92% complete. Approximately 120 miles remain to be inspected and are primarily located within the San Joaquin River Flood Control System. The annual inspection completion schedule is as follows:

- Remaining levee inspections are scheduled to be completed by December 14
- Assignment of Annual Maintenance Ratings are scheduled to be completed by December 31
- Submittal to Corps tentatively scheduled for January 4, 2008

### Preliminary findings:

- Levee Inspections
  - Encroachments: A large number of encroachments that obstruct visibility and flood fight access to landside levee slopes and toe easements exist throughout the system. It is likely that the Corps of Engineers would find such encroachments unacceptable during their Quality Assurance inspections. Unacceptable ratings could lead to loss of PL 84-99 eligibility and FEMA certification for those districts, most of which are in urban areas. The Corps has indicated that they will only accept encroachments whose permit applications were reviewed and actively approved by the Corps.
  - Some districts will likely receive unacceptable maintenance ratings (primarily due to vegetation and encroachments)
  - Overall levee maintenance has improved as a result of recent Corps policies; however, encroachments have not been addressed systematically.

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## **Flood Control System Evaluations and Reporting**

The *Flood Project Integrity and Inspection Branch (FPIIB)* has initiated a new multi-discipline program composed of several integrated elements designed to provide local and system wide evaluation and assessment of the flood control system, facilitate information dissemination and local, regional and system wide reporting, and provide enhanced decision support applications and capabilities to the Flood Center during emergency response operations and high water events. Elements of this program include:

### **Flood System Evaluation Support Infrastructure**

The evaluation support infrastructure under development expands upon the data foundation of both the California levee database and the Division of Flood Management database. Designed to support evaluation and assessment of the flood control system, the infrastructure is incorporating original flood project design data, levels of flood protection, flood system discrepancies, maintenance inspection information, and levee distress, repair and improvement information. Geospatial information applications are being developed as part of this process to assist in the performance evaluation of the flood system, to aid risk assessment studies, and to enhance decision support capabilities during emergency response operations and high water events.

### **Geotechnical and Hydraulic Evaluations**

Staff is initiating structural integrity and hydraulic capacity evaluations of the flood control system. Site specific geotechnical evaluations are being conducted within high interest areas of the flood control system using newly developed geo-referencing tools, considering historical distress information, and using new subsurface information resulting from the levee evaluations efforts. Staff is establishing protocols to develop, update, and maintain a library of hydraulic models for the Central Valley for use in evaluating the performance and capacity of channels, assessing the hydraulic impacts of new projects, and identifying issues affecting operation and maintenance of the system. A combined evaluation process will be used to assess the performance of repairs and improvements, evaluate system optimization strategies, and make recommendations for flood system improvements.

### **System Status Reporting and Emergency Response Decision Support**

The evaluation support infrastructure will provide the means for access to and exchange of several layers of information. The integration of the system evaluations, database information, and geospatial and/or web-based applications elements will allow for the production of comprehensive reports tailored to specific local, regional, or system-wide issues or concerns including individual Local Maintaining Agency reports, protected area reports, and annual system status reports. Incorporating these elements with CDEC river stage and hydrology information will further advance the understanding of the function and performance of the flood control system, and provide enhanced decision support applications and capabilities to the Flood Center during emergency response operations.

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### Central Valley Levee Erosion Surveys and Repairs

Since 1998, Ayres Associates has annually assisted the Corps and their local sponsors with inventory and review of erosion sites on the Sacramento River Flood Control System. The purpose of this review is to monitor and document the condition of previously identified erosion sites, inventory any new erosion sites and identify critical erosion sites that appear to threaten the structural integrity of the flood control system.

In 2006, DWR conducted waterside erosion surveys of the San Joaquin River Flood Control System. The purpose was to inventory any new erosion sites other than the PL 84-99 sites. The following table provides the 2006 erosion sites inventory for both river systems and their repair status.

Central Valley River System	Total Erosion Sites Identified	Ayres Associates Inventoried Sites	DWR Inventoried Sites	PL 84-99 Rehabilitation Assistance Program Sites	*Erosion Sites Repaired to Date
Sacramento	344	200	-	144	101
San Joaquin	159	-	117	42	35

\* These numbers may have changed since this information was collected.

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## **2007 State Maintenance Achievements**

### **Personnel**

- Over the past year, added 6 new positions to Flood Maintenance Office staff to restore operation to historic levels and anticipate filling 4 new positions.

### **Equipment Acquisition**

- Initiated paperwork to acquire \$1.26 M in new heavy and light equipment needed to improve emergency response and flood control project maintenance.
- Received approximately \$1.7M in new heavy and light equipment for Maintenance Yards.

### **Emergency Response/Preparedness**

- Operated Sutter Basin (two plants) during winter months to pump interior runoff into Sutter Bypass.
- Completing preseason training and restocked inventory of flood fighting materials at Maintenance Yards.

### **Levee Maintenance**

- Completed routine maintenance on 294 miles of levees in accordance with Corps standards.
- Began drilling to collect design data for construction of a seepage berm along the landside toe of the East Levee of the Sutter Bypass and a slurry wall along the South Levee of Tisdale Bypass.
- Completing application of herbicides to 294 miles of levee crown roadways and 282 miles of waterside and landside toe roads.
- Expanded rodent abatement program.
- Grouted 1,844 rodent holes along Cache Creek and Sacramento River (MA 9) levees.

### **Channel Maintenance**

- Completed vegetation management activities needed to insure safe passage of design flows on 2,387 acres of Sacramento River Flood Control Project Channels.
- Cleared excess debris and downed trees from Tisdale Bypass in preparation of the Sediment Removal Project, Colusa Bypass, Bear River and Little Chico Creek. Clearing of debris at Feather River at O'Conner Lakes and Lake of the Woods should be completed by the end of next month.
- Clearing brush in Cache Creek Settling Basin and in Cache Creek channel above Highway 102.

### **Sediment Removal**

- Completing this month the removal of 1.7M cy of sediment from Tisdale Bypass.
- Working on design and permit acquisition for removing 50,000 cy of sediment from Sycamore Creek at Cohasset Road Bridge during the summer of 2008.
- Removed 40 cy of sediment from in front of the Little Chico Creek Diversion Structure.
- Began planning for the removal of 250,000 cy of sediment from Cherokee Canal from Cottonwood Creek to the Richvale-Chico Highway. Construction planned for summer of 2008.

### **Bridge Replacement**

- With the assistance of Sutter County, completed the replacement of O'Bannon Road Bridge at Lateral No. 6 canal.
- Working with Sutter County completed securing federal funding to allow the selection of a construction contractor to proceed for the replacement of the Garmire Road Bridge at the Tisdale Bypass.

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## **Facility Repairs/Replacement**

- Completed the rehabilitation of pumps and motors at three State-operated pumping plants along the east levee of the Sutter Bypass.
- Continued the design and permit acquisition to replace Weir 2 and Willow Slough Control Structure located along the East Borrow Pit of the Sutter Bypass. Construction expected to begin in spring 2009.
- Completed minor structural repairs of buildings at the Sacramento Maintenance Yard administration building.
- Began construction of a new building at the Sutter Maintenance Yard for administration, warehousing and housing remote pump control system for Sutter pumping plants.
- Installed three water level gaging stations at various locations in Sutter Bypass East Borrow Canal.
- Replaced damaged corrugated buried pipe in seepage ditch at Gilsizer Slough.
- Cleared vegetation in 9 miles of drainage ditches discharging into Sutter Pumping plants.
- Replaced wooden bridge with concrete bridge (EI#5) over Eastern Interceptor Canal.
- Excavated 4,000-foot drainage channel to support Tisdale Bypass Sediment Removal Project.

## **Regulatory Compliance**

- Continued "Interagency Flood Management Collaborative Program" with State and federal resource agencies to develop regional management strategies for the Sacramento and San Joaquin River Flood Control Projects. Focused on developing streamlined permit process for small erosion repair sites.
- Began process to obtain regional general permit for routine flood control maintenance activities subject to Section 404 of the Clean Water Act.

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## 2007 Channel Clearing Summary

### Sac Yard Channel Clearing (acres)

Location '	Sprayed	Mowed	Proposed Clearing	Total
Putah Creek	6			6
Willow Slough	8			8
Sac Bypass	10			10
Fremont Weir	5	475		480
Ridge Cut	8	71		79
Cache Creek	24	40	20	84
Natomas Cross Ch.	6		2	6
NEMDC	10	14		24
Arcade Creek	4			4
Magpie Creek	4			4
Yolo Bypass	6			6
Schriener	6	60		66
Furlan		80		80
<b>Total</b>	<b>97</b>	<b>740</b>	<b>22</b>	<b>859</b>

### Sutter Yard Channel Clearing (acres)

Location	Sprayed	Disked	Mowed	Hand Cleared	Proposed Clearing	Total
Bear River Area	13			50		63
Sutter Bypass		80	25	12		117
Cherokee Canal			725	8		733
Feather River Channel					400	400
Butte Creek				25		25
Colusa Bypass					40	40
Little Chico Creek	8			6		14
Sycamore Creek			15			15
Elder Creek				10		10
Yuba River			80			80
Sutter Basin				4		4
M & T Mitigation Site			25			25
Middle Creek	9			23		32
<b>Total</b>	<b>30</b>	<b>80</b>	<b>870</b>	<b>138</b>	<b>440</b>	<b>1,558</b>